

## VTOL to Transonic Aircraft, Phase I

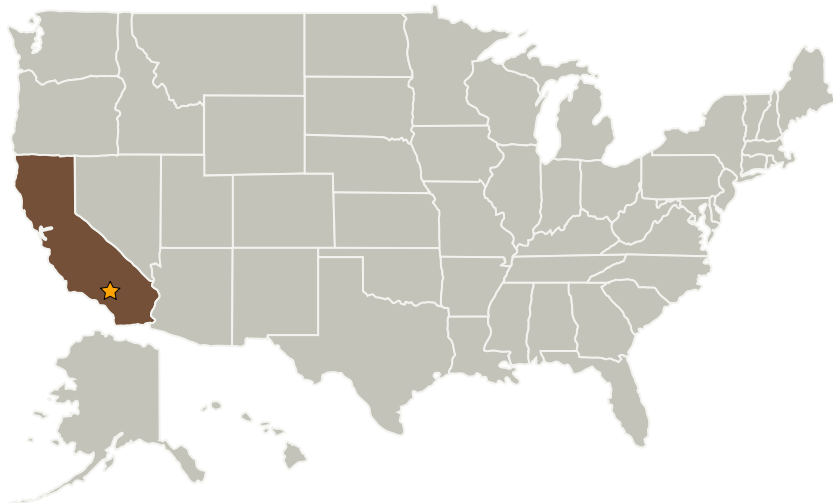
Completed Technology Project (2006 - 2006)



## Project Introduction

The cyclogyro, an aircraft propulsion concept with the potential for VTOL to the lower bounds of transonic flight, is conceptually simple but structurally and aerodynamically complex. To our knowledge no cyclogyro has ever flown. We propose to demonstrate through simulation and rotor testing that with appropriately designed cyclogyro rotors and propulsion algorithms, aircraft can transition smoothly from low-speed and vertical flight to near-transonic forward flight. We posit that lift and propulsion can be achieved while increasing the aircraft critical mach number above that of conventional subsonic airplanes with fixed wings. We will show that thrust and lift can be maintained across all speeds, and attainable thrust increases with increasing airspeed for constant rotor speed. Gliding and vertical autorotation can be performed safely with rotors stopped or rotating, respectively.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California
Acuity Technologies, Inc.	Supporting Organization	Industry	Menlo Park, California



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Armstrong Flight Research Center (AFRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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### Primary U.S. Work Locations

California

### Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

### Technology Areas

**Primary:**

- TX15 Flight Vehicle Systems
  - └ TX15.1 Aerosciences
    - └ TX15.1.6 Advanced Atmospheric Flight Vehicles